

## CHAPTER 241 APPROVE AREA NAVIGATIONAL SYSTEMS

### Section 1 Background

#### 1. PTRS ACTIVITY CODES

- Avionics: 5432

**3. OBJECTIVE.** This chapter provides guidance for approving area navigational systems.

**5. GENERAL.** The Aviation Safety Inspector (ASI), may need to refer to specific Advisory Circular(s) and regulations for individual systems in order to accomplish this approval.

*A. Approvals.* Field approval for an Area Navigation (RNAV) system should not be considered unless the applicant has provided previously approved data. This data must be in the form of a Type Certificate (TC) or Supplemental Type Certificate (STC) for an airplane or rotorcraft of like or similar configuration utilizing approved system components.

(1) For FAR Part 121 operators, inertial navigation systems and dopplers must meet the requirements specified in FAR Part 121, Appendix G, prior to formal approval. Under these requirements a Supplemental Type Certificate must be obtained by the applicant.

(2) Installation approvals of other types of area navigation equipment should be obtained with a Supplemental Type Certificate. However, approval can also be obtained by submission of substantiating data with either an FAA Form 337 or an air carrier engineering authorization.

(3) The applicant must furnish all of the installation data necessary to determine the adequacy of the installation. Such data should include the following:

- Manufacturer's instructions
- Electrical schematics and failure protection

- Installation information and/or photographs
- Substantiation of structural changes
- Determination of capability of electrical system and failure protection to handle additional load
- Any other data determined necessary for approval

(4) FAA-approved manufacturer service bulletins which list approved instructions for the installation of certain Area Navigation Systems may be used.

(a) In some cases, the facility making the installation has demonstrated its ability to install this equipment on a representative number of similar type installations through field approvals.

(b) References to previous approvals on FAA Form 337 would constitute previously-approved data and may not require a separate field approval. In this case, a letter from the FSDO or General Aviation District Office authorizing the installation facility to perform similar installations would be appropriate.

(c) Alterations which do not differ appreciably from previously approved changes may not require new or additional approval.

**B.** An installation may be approved for VFR operation after meeting the provisions discussed above. The aircraft should be placarded to limit the use of the Area Navigation System to VFR only, unless the aircraft itself is limited to VFR.

**C.** Systems do not require VFR approval prior to IFR approval. An application for IFR approval should contain data substantiating that the equipment and installation meet the criteria in Advisory Circular 90-45, Appendix A, Approval

of Area Navigation Systems for Use in the U.S. National Airspace System, as amended.

#### *D. Original VFR Approval Changes to IFR Approval.*

Operators have installed area navigation systems in a variety of aircraft for use in VFR operations only. Operators have the option of upgrading these systems to allow for IFR operations as well.

(1) When such a request is received, an FAA Form 337 should be prepared on which the approval for IFR operations will be properly documented. Item 8 of FAA Form 337 should provide at least the following information:

- Reference to the FAA Form 337 which recorded the original VFR Area Navigation System installation
- Data to confirm that the requirements of Advisory Circular 90-45, Appendix A, as amended, paragraphs 2 and 3, have been met

- If a flight test is conducted, a statement to document the modes of IFR operation for which the system is being approved

(2) The data approval stamp, properly completed, should be placed in Block 3 of FAA Form 337.

(3) If the aircraft has an FAA-approved flight manual, a supplement to the manual may be prepared and submitted for approval, in accordance with regional procedures.

(a) An additional copy of the FAA Form 337 detailing the original installation must accompany the flight manual supplement approval request.

(b) The date of the flight manual supplement must not be later than the approval for return-to-service date, as shown on the FAA Form 337.

(4) If the aircraft does not have an FAA-approved flight manual, then information on equipment operating limitations and manufacturer's operating instructions must be provided to the pilot by means of a placard.

## **Section 2 Procedures**

### **1. PREREQUISITES AND COORDINATION REQUIREMENTS**

#### *A. Prerequisites*

- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent
- Identification and authorization to perform field approvals by the regional Flight Standards Division

*B. Coordination.* Engineering assistance should be obtained for a field approval unless the Aviation Safety Inspector (ASI) has previous experience with area navigation installations and feels competent to make such an approval.

### **3. REFERENCES, FORMS, AND JOB AIDS**

#### *A. References*

- FAR Part 121, Appendix G
- Advisory Circular 20-101, Omega and Omega/VLF Navigation Systems Approvals for Use in the Conterminous United States and Alaska, as amended
- Advisory Circular 20-121, Airworthiness Approval of Airborne Loran-C Systems for Use in the U.S. National Airspace System, as amended
- Advisory Circular 25-4, Inertial Navigation Systems, as amended
- Advisory Circular 90-45, Appendix A, as amended, Approval of Area Navigation Systems for Use in the U.S. National Airspace System, as amended
- Advisory Circular 120-31, Operational and Airworthiness Approval of Airborne Omega

Radio Navigation Systems as a Means of Updating Self-Contained Navigation Systems, as amended

- Advisory Circular 120-33, Operational Approval of Airborne Long-Range Navigation Systems for Flight Within the North Atlantic Minimum Navigation Performance Specifications Airspace, as amended
- Advisory Circular 120-37, Operational and Airworthiness Approval of Airborne Omega Radio Navigational Systems as a Sole Means of Long Range Navigation Outside the United States, as amended
- Advisory Circular 121-13, Self-Contained Navigation Systems (Long-Range), as amended
- Order 8300.10, Vol. 2, Ch. 1, Perform Field Approval of Major Repairs and Major Alterations

#### B. *Forms*

- FAA Form 337, Major Repair and Alteration

#### C. *Job Aids.* None.

### 5. PROCEDURES

A. *Follow the Procedures Detailed in the Applicable Advisory Circular(s)*

B. *Review the Operator's Data.* Review Supplemental Type Certificate(s) and installation data, as applicable. Extra consideration must be given to the following:

(1) Manufacturer's instructions and limitations, including necessary modification and calibration of all units in the system and previously installed equipment

(2) Interface with auxiliary equipment, sensor inputs, meter loading and sensitivity, etc.

(3) Any reasonable probable failure of the equipment which would cause a flight hazard or affect the normal operation of required equipment to which it is connected

(4) Display location

#### C. *Conduct Inspections, as Necessary*

(1) Conduct a conformity inspection to ensure the installation conforms to the approved data.

(2) Monitor the ground operational/functional check performed by the installing agency.

(3) Ensure that the aircraft is appropriately placarded regarding the limitations of the equipment.

#### D. *Review FAA Form 337*

(1) Ensure that certification dates of flight and/or bench tests are provided.

(2) Ensure that limitations on types of approval are clearly stated in Block 8 of FAA Form 337 and on any required approved operations specifications.

E. *Review the Operator Training Programs.* Ensure that the operator establishes training programs on the new equipment and reviews the existing programs on associated equipment. In addition, accomplish the following:

- Conduct spot checks of the training records
- Observe the actual training sessions
- Ensure that the training emphasizes the new equipment, new maintenance techniques, and new procedures and standards

### 7. TASK OUTCOMES

#### A. *File PTRS Transmittal Form*

B. Completion of this task may result in the following:

- Approval of the installation of the equipment

- If the facility making the installation has demonstrated its ability to install the equipment on a representative number of similar type installations through field approvals, an approval letter sent by

the FSDO or General Aviation District Office authorizing the installation facility to perform similar installations

**9. FUTURE ACTIVITIES.** None.